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Providing services to children with autism (ages 0 to 2 years) and their families

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OVER THE PAST two decades, major advances have been made in our knowledge of the syndrome of autism. These advances have resulted in improvements in the provision of education and treatment to children with autism and their families. In the 1960s, applied researchers using behavioral approaches demonstrated that autistic children can learn and be educated. Work in the 1970s refined behavioral techniques, provided preliminary evidence for the neurological bases of the disorder, and laid the groundwork for exploring the developmental relationship between cognitive, social, and language impairments in autism. Achievements of the 1980s have provided preliminary evidence of neurological impairment involving subcortical structures with secondary impairment of cortical development. Additionally, recent emphasis has been placed on the application of developmental information to explain the various social, cognitive, and communicative symptoms of autism. Impending goals for

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the next decade are to improve early identification efforts, to further increase our understanding of etiological factors, to demonstrate the efficacy of different treatment and educational approaches, and to integrate educational contributions from various approaches (e.g., behavioral and developmental approaches).

The language specialist plays a key role in the education and treatment of autistic children since the core symptoms of autism include impairments in speech, language, and communication, and in language-related cognitive and social skills (Prizant, 1982). The current definition of autism proposed by the American Psychiatric Association includes the following three diagnostic criteria: "qualitative impairment in reciprocal social interaction," "qualitative impairment in verbal and nonverbal communication, and in imaginative activity," and a "markedly restricted repertoire of activities and interests" (American Psychiatric Association, 1987, p. 38–39). This definition reflects the recent emphasis on impairments of social interaction, communication, and symbolic activities.

The majority of children identified as having the autistic syndrome are reported to demonstrate symptomatology within the first 2 years of life, but in practice, may not be diagnosed until 3 to 5 years of age at the earliest, with many diagnosed at a later age. Early identification of autism should improve considerably due to the expansion of child find services and increased sophistication in psychosocial and communication evaluations for infants and toddlers. The passage of the Education of the Handicapped Act Amendments of 1986 (P.L. 99-457) establishes the availability of federal funds to states choosing to implement early intervention programs for handicapped/high risk children from birth to 2 years (i.e., during the first 3 years of life until the third birthday). The downward extension of early intervention programs serving children from birth to 2 years will become more prevalent in the coming years. Thus, there is an urgent need for professionals to sharpen their clinical skills in all aspects of service provision for this young age level.

EARLY SYMPTOMATOLOGY AND EARLY IDENTIFICATION

Early diagnosis a difficult task

Identification and diagnosis of autism during the first 18 months of life have been extremely rare occurrences. Factors precluding early identification are many and varied, and include the variability of behavior in children, the lack of appropriate referrals by professionals to whom parents express concern, and/or the family's lack of knowledge of services or access to services. Currently, retrospective accounts of parents whose children have been diagnosed as having autism are the primary source of information about behavioral symptomatology in the first 18 months of life (for example, see DeMyer, 1979). Validity of such accounts is problematic due to limitations on recall (parents may "tell their story" many years later), and the need for parents to have a standard of comparison for what "normal" behavior is during this period of development, especially when the affected child is the first born.

Further complicating the picture is the

variability of behavioral profiles of infants later diagnosed as autistic. A consistent early profile predictive of autism could help to reliably distinguish these children from other children with developmental disorders or even from normally developing children. However, research findings suggest that there may not be a single early behavioral profile characterizing this population. For example, Coleman and Gillberg (1985) noted that in the first year of life, there are at least two general "modes of presentation" for children later diagnosed as autistic: the "model" infant who not only presents few demands, but who also may be somewhat lethargic and appears to prefer to be left alone, and the "terrible" or highly irritable infant who has sleeping problems, is frequently screaming or crying, and is difficult to console.

In addition to these two extreme profiles, it is now widely accepted that there are at least two different subgroups of autistic children distinguished on the basis of clinical onset (Freeman & Ritvo, 1984). Most autistic children demonstrate developmental delays and observable symptoms early in life, while as many as 20% have a history of normal development in the first year or two of life with subsequent developmental arrest or regression accompanied by the onset of specific symptomatology. For the latter group, parents often report that problems were first noted following an illness accompanied by a high fever. In some cases, no identifiable precipitant is reported. Until recently, an additional criterion of the diagnosis of autism was an onset prior to 30 months. This criterion was eliminated due to the difficulty in confirming age of onset for some children, as well as increased recognition that others may demonstrate the full symptom picture of autism, but have an onset up to 5 or 6 years of age, and in rare cases later in childhood (APA, 1987).

Ornitz, Guthrie, and Farley (1977) identified nonspecific and specific symptomatology observed in those infants who are symptomatic in the first year. Nonspecific symptoms are those that may be observed in children with other disabilities or even in children whose development is essentially normal in other ways, for example, hyperactivity, lethargy, sleep problems, and/or feeding difficulties. Specific symptoms entail those more closely related to social and communicative functioning and other characteristics associated with autism and include peculiarities of gaze behavior (i.e., frequent gaze aversion or empty staring), lack of a social smile, lack of responsiveness to sounds, and lack of anticipation of others' social approaches. In addition, vocalization may be minimal or babbling may stop, and imitation of sound or gestures and responsiveness to early social games may be absent or limited (Freeman & Ritvo, 1984). Some parents also report the presence of stereotypic motility patterns such as rocking behaviors or repetitive hand movements. As with nonspecific symptoms, many of these so-called specific symptoms also may be observed in normally developing children. For example, infants use gaze aversion to regulate social interaction and control the amount of stimulation they receive (Stern, 1977). However, it is the frequency and clustering of these symptoms that result in a picture of severely impaired social

relatedness early in development—the hallmark of the autistic syndrome.

The early identification of autistic children is further complicated by some aspects of development that proceed normally. Most children diagnosed as autistic do not present with significant medical problems early in development even though there tends to be an increased incidence of prenatal and postnatal problems when compared to normal controls (Coleman & Gillberg, 1985). Many children also do not demonstrate significant delays in gross motor milestones, may be physically attractive, and even appear to be extremely alert at times, resulting in an inconsistent and spurious picture of normalcy. Without obvious medical problems, further referrals may not be made, giving parents an implicit message that nothing is terribly wrong. Without early diagnosis, the child's condition remains somewhat ambiguous, which may lead to disagreements between family members as to whether there is cause for concern and what the appropriate course of action should be (Bristol, 1985).

Social and communicative impairment is one of the most stressful aspects of a young child's behavior for the family (Bristol, 1988). In addition to delayed language development, children may actively avoid social contact with others. Conventional nonverbal communication (e.g., pointing, requesting, showing gestures, head shakes, and nods) may be virtually absent. Some children who had been developing language may become mute. Kurita (1985) reported that 37.2% of a sample of 261 Japanese autistic children lost meaningful speech prior to 30 months of age. Others may become echolalic during the later part of this period raising the hopes of parents because of the development of speech, yet causing distress to parents at the typically noncommunicative nature and strange quality of early echolalic patterns.

During the period between 18 and 36 months, problems that become more pronounced may include the development of temper tantrums, more frequent repetitive movements (whirling, hand flapping) and ritualistic play (e.g., lining up objects), extreme reactions to specific sensory stimuli, and hyperactivity (Freeman & Ritvo, 1984; Ornitz, Guthrie, & Farley, 1977). Social and symbolic play may be strikingly absent, and difficulties in language comprehension may become evident. Interactions have a one-sided quality, with adults or other children having to take the major responsibility for initiating and maintaining social contact. The stereotype of the autistic child being in a world of his or her own is probably more true between 18 to 36 months than during any other time period.

Refining early identification efforts

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more comprehensive multidisciplinary services available in both urban and rural areas. A greater understanding of the variability of behavior within the autistic syndrome and increased recognition of the positive impact of early intervention have resulted in attitudinal changes leading many professionals to abandon "wait and see" attitudes in favor of making referrals to obtain further information or to rule out problems. Unfortunately, ignorance of and misinformation about autism still abounds, leaving parents frustrated and even bitter about their experience with professionals, while precluding early identification and service provision.

Since autistic children may not show significant medical problems or delays in gross motor development early in life, they typically are not identified as at-risk for developmental problems. The first obvious indicator to parents or physicians that the child is not developing normally may be the absence of, delay in, or regression in, language acquisition. Children normally begin using words between 12 and 18 months of age. Therefore, a child may not be referred for a delay in language development until 18 to 24 months at the earliest, allowing for a normal range of variation when the point of reference is the emergence of words. Some autistic children may use first words before 18 months, further obscuring early identification. Thus, the time of language emergence may not be a sensitive indicator for the early identification of autism. However, recent research in communicative intent has provided a valuable framework to improve early assessment efforts (Prizant & Wetherby, 1987).

The importance of prelinguistic communicative, cognitive, and social development for the acquisition of language has been emphasized in the child language literature during the past decade (Bates, 1979; Bruner, 1981). This information holds important implications for the early identification of children with communication impairments. The range of symptoms that characterize autism suggests that impairments of social interaction, communication, and symbolic activities should be evident in young autistic children, even prior to the emergence of words. Thus, the child's profile of communicative and symbolic behavior likely will be a sensitive measure for the early identification and differential diagnosis of children with autistic characteristics.

EARLY INTERVENTION AS PREVENTION

A major premise underlying the provision of early intervention is that the facilitative effects of intervention on development are greater earlier in life than later (Wetherby, 1985). The effects of early intervention may involve both neurological and behavioral changes, as well as positive influences on a family's ability to deal with this perplexing disorder.

The formation of neural connections is dependent on stimulation from the environment during critical periods of development (e.g., Rutledge, 1976; Schapiro & Vulkovich, 1970). The influence of the environment on brain structure and function is greatest during the first few years of life when the brain is relatively immature and growing rapidly, to take advantage of neural plasticity (Lenneberg, 1967). Neural plasticity, the capacity of the structure and function of the nervous system to be modified, diminishes with maturation.

Since autism is presumed to be caused by brain dysfunction with primary involvement of subcortical systems (see Schopler & Mesibov, 1987), early intervention offers a better chance of stimulating new connections or compensatory pathways for these impaired systems (see Lund, 1978).

The young autistic child is impaired in the ability to engage in social interaction, to process social stimuli, and to use flexible, exploratory action schemes to foster cognitive development. These impairments in social interaction, communication, and symbolic activities may result in an environment that is inadequate for neural maturation, that is, the child may not be able to elicit and/or process necessary social and environmental stimulation during critical periods. This inability may have a detrimental impact on neurological development, and thus, may compound the underlying brain dysfunction. While further research clearly is needed to provide support for this argument, some indirect evidence can be found in Sameroff and Chandler's (1975) review of the literature on early development of children. They indicated that developmental outcomes are influenced more by a family's socioeconomic status, and conceivably, quality of the environment and caregiving, than by early neurological status. This notion should underscore the importance of early intervention and help families develop an optimistic rather than a pessimistic view on the potential for neurodevelopmental change.

Early intervention also may prevent the development of maladaptive behaviors. Due to the nature of the severe social and communication impairment, children with autism are at high risk for the development of significant behavior problems. Recent research and clinical literature have emphasized the social–communicative basis of maladaptive behavior (e.g., temper tantrums being used to protest rather than more conventional symbolic signals). One obvious implication is that early communication intervention may serve to preclude the development of potentially dangerous and disruptive behavior. Current literature in child psychiatry is also emphasizing early communication intervention as a strategy for prevention of emotional and behavioral problems in communicatively impaired children (Beitchman, 1985; Baker & Cantwell, 1984). Clearly, issues of communication development and behavior management can no longer be viewed as mutually exclusive for children with communication impairments (Prizant & Wetherby, in press).

Finally, early communication intervention may impact positively on social development. Communication problems exacerbate problems of social relatedness for autistic children (Garfin & Lord, 1986). As children with autism become more motivated to engage others in social exchange, breakdowns may occur primarily due to linguistic and communicative limitations. Thus, early communication intervention has the potential to prevent increased social isolation and withdrawal. When the focus of intervention is on enhancing interaction between the child and others, improvement in both communication and social ability is mutually interdependent. This should allow a child to benefit from increased social stimulation, and help family members to experience some

enjoyment from the resulting social interaction.

To date, there is virtually no empirical evidence of the effectiveness of intervention with autistic children from birth to 2 years, since in practice children have not been identified by this age. However, there is now accumulating evidence on the effectiveness of early intervention with 3- to 5-year-old autistic children. Simeonsson, Olley, and Rosenthal (1987) reviewed empirical studies of treatment of autistic children 5 years of age and younger. Although the number of studies with adequate research designs was small, the findings of the three most comprehensive studies (Fenske, Zalenski, Krantz, & McClannahan, in press; Hoyson, Jamieson, & Strain, 1984; Lovaas, 1987) were impressive, with a substantial number of children achieving normal levels of social and intellectual functioning by kindergarten. Simeonsson, Olley, and Rosenthal (1987) identified the following common features that may have contributed to the success of these programs: (1) use of structured behavioral approaches that targeted specific skills and employed positive consequences; (2) training of parents to implement the program at home; (3) implementation of the program before the age of 5; (4) use of an intensive program that involved many hours a day, 5 days a week, year-round, with parents carrying over at home; and (5) emphasis on generalization by using natural settings and involving parents and peers.

The studies reviewed by Simeonsson, Olley, and Rosenthal (1987), for the most part, used behavioral approaches. The lack of a significant literature reporting outcome with other than "behavioral approaches" does not necessarily imply that only behavioral approaches are effective. Furthermore, behavioral approaches are highly heterogeneous in reference to methodology and content. Certainly, aspects of developmental as well as behavioral approaches are being integrated in current programs (see Prizant & Wetherby, in press, for further discussion). Indeed, it has been suggested that developmental approaches are more appropriate with young children but have limitations with adolescents and adults (Dawson & Galpert, 1986). Further research is needed to explore the relationship between educational approach and age as well as developmental level of the child. However, during the interim it seems prudent to use developmental strategies with very young autistic children.

While there is evidence of the greater effectiveness of intervention before the age of 5 than after age 5 (Fenske, Zalenski, Krantz, & McClannahan, in press), it seems reasonable to assume that the impact of intervention for the child and the family would be even greater before age 3. In designing programs for young autistic children, special consideration should be given to using developmentally sound approaches, with an emphasis on addressing the core symptoms of autism, that is, social interaction and social relatedness, communication, and symbolic behavior. Early intervention has the potential to make a substantial impact on the child, and in some cases may prevent the need for special education by school age (Lovaas, 1987). It may also provide support for families and thus lessen the significant stress parents and siblings may experience (Bristol, 1985).

APPROACHES TO EARLY ASSESSMENT

The purpose of assessing the communication skills of a young child with autistic characteristics may range from identifying a problem to determining a child's developmental level across domains in order to target intervention goals. The communication assessment may also contribute information toward the differential diagnosis of autism from other developmental disorders. For children from birth to 2 years of age, however, the major emphasis should be on identifying and understanding the nature of a social communicative impairment and providing preliminary directions for intervention, rather than establishing a diagnosis. The assessment plan should be guided by normal developmental information and theories explaining the nature of the communication impairment of autistic children (Prizant & Wetherby, in press). Since autistic children's speech, language, and communication impairments are most apparent in the social use of language (i.e., pragmatics), traditional formal assessment instruments have limited utility. Therefore, clinicians must rely on the systematic use of informal procedures to assess communication. In designing an assessment plan, the clinician first needs to determine the key content areas to be addressed, and then can select strategies to explore these areas. This section will provide a framework for a clinician-designed assessment of communication with young children diagnosed as, or suspected of having, autism. This framework also is relevant for all young children who have or are suspected of having developmental delays.

Content of assessment

In the first 2 years, a child's behavior becomes increasingly more deliberate and goal directed, showing increased evidence of foresight, and culminating with the ability to plan behavior through symbolic thought. The development of intentional communication lies at the interface of emerging intentionality within cognitive, social, and affective domains. In normal development, preverbal intentional communication provides a foundation for the emergence of symbolic, referential language. The autistic child experiences cognitive, social, and affective impairments, which disrupt the normal development of language. In order to address underlying impairments in social cognition, a communication assessment needs to focus on two major content areas: (1) the child's profile of communicative behaviors, and (2) the child's symbolic level across cognitive–social and language domains.

Table 1 identifies the major content areas that need to be examined to develop a communicative profile. If a child is at a preintentional level, assessment should identify any behavior that serves a communicative function based on the adult's interpretation of the act. Assessment should identify what a child attempts to accomplish (intents expressed) and actu-

Assessment should identify what a child attempts to accomplish (intents expressed) and actually accomplishes (functions of communication) in his or her communicative behavior.

Table 1. Assessment dimensions of a communication profile

Repertoire of communicative functions
- regulate another's behavior
- engage in social interaction
- reference joint attention

Degree of intentionality for each function
- awareness of a desired goal
- simple plan designed to achieve the goal
- coordinated plan designed to achieve a goal
- alternative plans used if met with failure
- metapragmatic awareness of the success or failure of the plan

Variety and sophistication of communicative means for each function
- reenactive to symbolic representation
- idiosyncratic to conventional act
- aberrant to socially acceptable behavior
- echolalic to creative speech
- gestural and/or vocal modality
- prelinguistic to complex linguistic rules

Reciprocity of communication
- ability to participate in turn-taking interactions
- ability to repeat or revise message as needed to repair communication breakdowns
- ability to assume shared knowledge and encode information needed by the listener to understand the message
- ability to collaborate on topics based on conventional meanings

ally accomplishes (functions of communication) in his or her communicative behavior. Normally developing children use prelinguistic gestures and vocalizations for the following functions prior to the emergence of speech: to regulate others' behavior, to engage in social interaction, and to reference joint attention (Bruner, 1981; Wetherby, Cain, Yonclas, & Walker, in press). Autistic children in the early stages of communication and language development have been found to show deficiencies in the range of communicative functions expressed (Wetherby & Prutting, 1984). Wetherby (1986) suggested that the easiest and first emerging category of functions for autistic children is regulating others' behavior, while the most difficult is referencing joint attention, presumably because of the differing social underpinnings of these abilities.

Autistic children may show discrepancies in the degree of intentionality, conventionality, and sophistication of communicative means for these different functions. For example, a young autistic child may use creative speech to regulate others' behavior, echolalic speech or gestural reenactment strategies to engage in social interaction, and show no intentional communication to reference joint attention. In assessment it is critical to determine the level of intentionality for each communicative function. That is, does the individual use a behavior for preplanned or intentional effects on others, and does the degree of intentionality vary with different communicative functions? Re-

cent research has demonstrated that unconventional, idiosyncratic, and aberrant behavior may be used intentionally to communicate for a variety of functions (Carr & Durand, 1986; Donnellan, Mirenda, Mesaros, & Fassbender, 1984; Wetherby & Prutting, 1984); therefore, a lack of conventionality or social acceptability should not preclude the possibility that a behavior is used purposefully to communicate. Similarly, the sophistication of communicative means should be evaluated for each function. A developmental continuum of intentionality and dimensions of communicative means to be assessed are listed in Table 1.

Autistic children also show difficulties with the reciprocity of communication, ranging from impairments in synchronizing and regulating turn-taking interactions to making poor judgments about what the listener needs to know to interpret their message (Dawson & Galpert, 1986). Higher functioning autistic children who reach a discourse level show difficulties with conversational contingency. They may initiate topics without identifying the referent and have difficulties revising a message to clarify what the listener needs to know. Maintaining a topic of joint focus is problematic when conversing with autistic children. For example, they may engage in a particular dialogue to complete a ritual rather than to share information. They may group words or follow topics by clanging, that is, by the way words sound rather than by their meaning (e.g., associating words that rhyme or have the same initial phoneme), making it hard for the listener to identify or maintain the topic. The dimensions of reciprocity that need to be evaluated are listed in Table 1.

Numerous studies of autistic children have found impairments in cognitive–social correlates of language (e.g., Dawson & Adams, 1984; Sigman & Ungerer, 1984; Wetherby & Prutting, 1984). Therefore, a communication assessment must compare the autistic child's ability to use symbols across cognitive–social and language domains. Determining autistic children's symbolic levels may be difficult because of their propensity for using reenactment strategies. That is, they may replicate an entire event or aspects of it as a means to achieve a goal (e.g., manipulating an adult's hand to open a door; or repeating a memorized portion of a book to request that book). Reenactment is indexical representation, rather than symbolic, in that the original event or part of the event is being used to stand for the whole event, and it precedes symbolic thought in normal development (Bruner, 1978; Piaget, 1954). Symbolic representation entails the use of one scheme as a symbol to stand for or represent a different scheme, and the relationship between the symbol and the referent may range from iconic to arbitrary. Paradoxically, a verbal autistic child, whose speech consists exclusively of immediate or delayed echolalia, may be functioning at a presymbolic level (Prizant & Rydell, 1984).

Autistic children's expressive language must be compared with their symbolic level in other domains to obtain an accurate picture of symbolic functioning. Domains that should be included in the assessment and general developmental progressions of symbolic representation

Table 2. Assessment dimensions of cognitive, social, and language correlates with developmental progressions from presymbolic to symbolic behavior

Means–end/tool use
- uses a tool that is contiguous with the goal as a means to obtain the goal (e.g., pulls string tied to object; pulls cloth under object)
- uses a tool that is noncontiguous with the goal as a means to obtain the goal (e.g., rakes in object with stick; moves chair in position and climbs on chair to obtain object on shelf)

Causality/communicative intent
- touches adult's hand or object to recreate spectacle
- uses gestural or vocal signal to regulate adult's behavior or to direct adult's attention
- discovers the source of an action (e.g., how to activate a mechanical toy; looks for the source of a thrown object)

Gestural/vocal imitation
- takes turns after adult imitates child's behavior or in familiar social routines
- imitates vocal or gestural behavior initiated by adult
- imitates a behavior at a much later time in the absence of the original model

Schemes for relating to objects/symbolic play
- explores the physical properties of objects
- uses recognitory gestures on realistic objects (e.g., combs own hair; brushes own teeth; eats from spoon)
- uses pretend schemes with miniature objects toward self (e.g., rolls toy car; drinks from doll's cup; pounds toy hammer
- uses pretend schemes toward others (e.g., feeds doll with bottle; combs mother's hair)
- uses multiple pretend schemes in sequence (e.g., stirs pretend food in pan; pours food onto dish; and feeds doll

Social relatedness/expression of emotion
- expresses emotions of joy, fear, and anger in appropriate situations or in response to adult's emotional expression
- responds differentially to strangers and caregivers
- uses gestural or vocal signals to establish closeness (e.g., pulls on adult's leg and reaches up to be picked up)
- knows how to get adult to react (e.g., to make adult laugh and make adult angry)
- expresses emotions of empathy, shame, guilt, affection, and defiance

Language comprehension
- uses nonlinguistic response strategies, including situational routines, contextual clues, intonation, gestures, and facial expression
- comprehends the meaning of single words (e.g., person names, object names, actions)
- comprehends multiword utterances based on semantic relations (e.g., action + object; agent + action; attribute + object)

Language production
- uses consistent preverbal forms tied to the context
- uses single word approximations or intoned jargon to encode dynamic, changing states, or objects that can be acted upon by the child
- uses multiword utterances to encode semantic relations (e.g., action + object; attribute + object)

Note: Adapted from Greenspan, & Lieberman (1980); McCune-Nicolich (1981); Miller, Chapman, Branston, & Reichle (1980); Uzgiris, & Hunt (1975); and Wetherby, & Prutting (1984).

within each of these domains are presented in Table 2. Again, these domains are relevant for all young children referred for assessment.

Assessment strategies

Due to the difficulty in assessing communicative behavior of autistic children, a combination of assessment strategies is recommended (Wetherby & Prizant, in press). A useful initial method for gathering information about the child's communicative behavior and symbolic level is to interview caregivers. The interview should include questions about, and solicit examples of, communicative behaviors outlined in Table 1 and symbolic skills in the domains outlined in Table 2. Peck and Schuler (1987) and Lapidus (1985) have developed interviews addressing communicative means and functions that may be referred to for this purpose. The use of caregivers as informants ensures that the assessment will address the communicative needs of the child and of people interacting with the child in everyday situations.

Based on the information obtained from the interview, a checklist or inventory of possible communicative behaviors and the functions they serve can be developed to measure communicative behavior observed in natural contexts. Observation of the child during daily activities is necessary to determine communicative needs and to evaluate the adequacy of natural opportunities for the child to communicate. Checklists, such as those developed by Donnellan, Mirenda, Mesaros, and Fassbender (1984) and Lapidus (1985), are particularly useful to establish which communicative means are used to express each communicative function in different settings with various partners. Similarly, checklists can be devised for observation of symbolic behaviors used spontaneously by the child in natural environments. While observation checklists provide critical information about the child's spontaneous use of communicative and symbolic behavior, it may be rather time consuming to wait for behaviors to occur naturally, and some of the child's abilities may not be demonstrated during the observation period.

Thus, a third method to supplement the observation checklist is behavior sampling. The purpose is to collect a representative sample of communicative and symbolic behavior typical of a child's range of functioning in a relatively short period of time, preferably on videotape for later analysis. Structured communicative situations may be staged to entice the child to interact and use a variety of communicative functions (see Schuler & Prizant, 1987; Wetherby & Prutting, 1984). Opportunities can also be set up for the child to use toys or objects instrumentally and symbolically to evaluate the child's level of symbolic representation. Some formal developmental scales for young children include items that may be useful for sampling symbolic skills. Consideration must be given to deciding who will interact with the child during behavior sampling. While it may be less time consuming for the clinician to serve as interactant, a more valid sample may be collected by having a caregiver interact with the child with the clinician demonstrating the procedures to the caregiver. With the birth to 2 years population, emphasis

should be on child interactions with a familiar adult.

During the interview, observation, and behavior sampling, the clinician can formulate hypotheses about the child's communicative profile and symbolic level across domains. The next step in assessment is hypothesis testing. Donnellan, Mirenda, Mesaros, and Fassbender (1984) described a procedure for testing hypotheses about the functions of aberrant behavior, which may be extended to other communicative behavior and symbolic abilities. The procedure entails manipulating antecedent and consequent events surrounding the occurrence of the behavior. For example, if a child persistently screams or displays self-injurious behavior when presented with a certain activity, one hypothesis is that the child is protesting. The adult can alternate between presenting that activity and a desirable one. If the child's behavior does not occur with the desired activity and ceases to occur once the undesired activity has been removed, this hypothesis has received support.

Hypothesis testing should be done on a continual basis over an extended period of time, not during only a single assessment session. This is especially pertinent when testing unconventional and primitive communicative acts. Furthermore, to ensure representativeness, the behaviors of concern should be tested in different environments with a variety of interactants. Thus, assessment should be considered an exploratory process that is ongoing rather than episodic.

These guidelines for assessment have been made with the assumption that the evaluation team or clinician will have access to a child and family members on an ongoing basis. In cases where a child is identified as requiring services, and services are available for the ages birth to 2 population, parents should be urged to take advantage of this support, and ongoing assessment can then become part of the services offered. However, a family may not live in a region with birth to 2 years services, may not have access to such services due to fiscal and geographical constraints, or the child may not demonstrate sufficient developmental delay or behavioral symptomatology at the time of evaluation to justify services. In such cases where questions remain, periodic follow-up assessments should be scheduled in order to monitor a child's development. At these times, parents should continue to be the primary source of information about their child's language and communicative development.

APPROACHES TO INTERVENTION

A thorough multidisciplinary evaluation should determine the need for early intervention services. When this need is indicated, the initiation of services for a child younger than 3 years of age may be both a relief as well as a great stress for families. Parents may be relieved that they are finally getting some professional support and guidance that should result in their child reaching his or her potential. On the other hand, a determination of the need for services confirms the significance of the child's disability. At this point families face the arduous task of coming to grips with the reality of their child's limitations. It is this acceptance that allows parents to begin to move forward and

become actively involved in intervention efforts (see Featherstone, 1980, for further consideration of the complex issue of accepting a child's disability). However, acceptance and understanding of autism may be particularly difficult due to the ambiguity of the disability (Bristol, 1988) and the uneven profile of abilities and disabilities (Prizant & Schuler, 1987a).

In this discussion of approaches to intervention, the emphasis will be on a family systems approach (Bristol, 1985) in designing appropriate intervention strategies for enhancing language and communication abilities. Within this framework, parents are viewed as partners in the process rather than as patients that need to be treated or dictated to (Bristol, 1985). Furthermore, this approach recognizes the impact that a severe disability such as autism can have on the day-to-day functioning of the family unit. Thus, intervention planning must include family members as active participants as well as addressing the needs of both the affected child and the family. In advocating for this approach, Bristol (1985) noted that

> "Intervention that affects only the child or even the child and one parent is not considered appropriate. The entire family is seen as one of an interactive, interdependent set of systems "nested" within each other. The child affects and is affected by the entire family system" (p.49).

Thus, success of an early intervention program cannot be measured solely in terms of child progress. Family involvement and family adaptation to the child must also be taken into account. A carefully coordinated multidisciplinary approach to early intervention is crucial to the goal of meeting a broad range of needs for the child and the family (see Rossetti, 1986, for further discussion of multidisciplinary team approaches).

These principles are especially relevant for efforts to enhance language and communication, for it is limitations in these skills that create the *most significant barriers* between the child and other family members. Conversely, progress in language and communication development may have a positive impact on a child's social, emotional, and adaptive functioning and foster more successful and mutually satisfying interactions between the child and significant others.

Home vs. center-based approaches

The two general models of service delivery in early intervention are distinguished on the basis of whether early intervention efforts occur in the child's home environment (i.e., home based) or at a professional or educational agency (center based). Each approach has specific strengths for language and communication enhancement.

Home-based approaches may be directed to the child and/or to the parents in enhancing the child's social communication and cognitive–social abilities, and helping the parents to develop an interactive style conducive to communicative growth. In addition to the convenience for the family, the provision of services within the home allows the early interventionist to observe, and take advantage of, regular family routines as a vehicle for communication enhancement. Modifications of the physical environment can be suggested in order to help create natural opportunities

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and needs for communication. Finally, other family members, including siblings and grandparents, can become involved in a setting that is familiar and comfortable to them. The major advantage of these approaches is their ecological soundness; that is, the services that are being provided directly to the family and the child are more likely to meet their needs, and acquired abilities are more likely to be used in daily routines. This is especially crucial for autistic children whose situation-specific learning style often results in generalization problems. Professionals also are able to get a more accurate picture of the child's abilities and the challenges parents face.

Center-based approaches also may be directed to the child, parents, or both. Going to a center for services can help to combat the feeling of isolation experienced by many families with handicapped children. Many centers run parent and sibling groups to provide an emotionally supportive forum to express concerns and share experiences. In specific reference to understanding communication problems and enhancing communication abilities, parents can compare notes and share "home-made" strategies. They also learn to understand their role as advocate for their child, an important skill considering the coming years of potential frustration in finding appropriate services.

Center-based approaches also provide an opportunity for the child to have varied experiences with many different people. Half-day or full-day programs can provide contact with other children in regularly scheduled activities or routines, providing opportunities for targeting specific language and social communicative goals. When such programs are available, parents are afforded much needed time to attend to other obligations or to get a "breather" from the demands of caring for their child. Some centers also offer respite services enabling families to live a more normal life. For more demanding children, these indirect support services often result in the family being able to maintain a child in the home setting rather than resorting to residential placement. Furthermore, family members have more energy for working with the affected child when it is not a full-time occurrence (Bristol, 1988).

Home- and center-based approaches are not mutually exclusive strategies. Benefits of both can be realized when agencies have the financial support and flexibility to provide both kinds of services. However, the effectiveness of either approach depends largely on the degree of active involvement and cooperation on the part of the family (Rossetti, 1986). As noted, approaches focusing solely on the child are episodic, and do not address life-span issues for the family. On the other hand, approaches that empower families by including them as partners in the early intervention process, and when requested, by educating them and providing them

with needed skills, have a much greater chance of having an immediate as well as a lasting impact (National Center for Clinical Infant Programs, 1985). For a more in-depth consideration of these issues, see Guralnick and Bennett (1987).

Content of intervention

The content of communication intervention may be derived from the assessment framework presented in Tables 1 and 2. Goals may be conceptualized bidimensionally along a horizontal and vertical axis (McLean, Snyder-McLean, Jacobs, & Rowland, 1981), borrowing from Piaget's (1954) concept of horizontal and vertical decalage. On the horizontal axis, goals involve expanding the child's repertoire of behaviors at the same developmental level. An example of a horizontal goal is to expand the child's range of communicative functions that emerge during the prelinguistic stage. Wetherby (1986) suggested an ontogeny of communicative functions to be used in intervention with autistic children. The first specific target should be the function of regulating others' behavior to achieve an environmental end through requests for objects and actions, and protests, if the child does not communicate for these functions. As the child progresses toward this goal, the adult can introduce social routines or games that involve adult–child turn-taking interactions with exchangeable roles, such as peek-a-boo (see McLean & Snyder-McLean, 1984). These games or routines form the bases for facilitating communication for the social end of attracting attention to oneself. After the child begins using communication to engage in social interaction, the adult can devise turn-taking interactions that introduce or manipulate objects systematically to facilitate the child's use of communication to direct attention to an object or event.

Other horizontal communication goals include expanding the child's repertoire of means to express intentions and to repair breakdowns. For example, at a prelanguage level, goals may include increasing the variety of vocalizations or gestures. At a language level, horizontal goals might include expanding vocabulary, semantic relations, or grammatical morphemes to enhance the variety of meanings and intents expressed. Horizontal goals should also target deficient cognitive–social skills. For example, for a child functioning in Stage IV of symbolic play, a horizontal goal would be to increase the variety of different action schemes used on objects and the number of different objects with which an action scheme can be used.

On the vertical axis, goals involve increasing the developmental complexity of behavior within the child's repertoire. In enhancing communicative knowledge and behavior, a primary goal is to help the child understand that signals can be used to affect people and to control the environment. For the very young or more severely impaired children, this vertical goal involves shaping noncommunicative exploratory behavior into deliberate and intentional use of the same or similar forms to effect specific outcomes. This may be achieved by constructing predictable interactive routines. Once knowledge of routine structure has been established, delay or discontinuance of an anticipated event often becomes a strong motivator

for communication (Schuler & Prizant, 1987).

Communicative persistence and repair reflect higher degrees of intentionality. Autistic children may not persist in expressing intent if initial communicative efforts are unsuccessful. While horizontal goals involve expanding the child's repertoire of communicative behavior, vertical movement entails teaching the child to persist in using these means, and if necessary, to repair unsuccessful communicative attempts by using alternative means. For children at preverbal levels or with poor speech intelligibility, communicative effectiveness may depend on a child's ability to combine communicative means (e.g., use vocalizations plus gestures) or shift to alternative communicative means. The recent movement to nonspeech systems for communicating (e.g., picture boards, sign language, sight–word boards, computerized devices) is providing subjects who have limited communicative ability with more conventional and more efficient means of communicating to repair breakdowns. At verbal levels, children may need to learn that there are alternative ways to express intent through language. The ability to develop strategies for repairing communicative breakdowns is essential in ensuring that the child's communicative act functions as intended.

Secondarily, more sophisticated, and more easily interpretable or conventional means should be targeted to express intent. Due to the idiosyncratic forms often used by autistic individuals, intervention goals must address conventionality of form. At nonverbal levels, partial reenactments may be comprehensible as an expression of intent only to those who are familiar with those situations. At verbal levels, echolalia and metaphorical language may be used with clear intent but limited effectiveness if their origin or referent is not shared by the listener. Another vertical goal related to conventionalization is the social acceptability of the expression of intent. However, social acceptability is not isomorphic with conventionality. Aberrant means such as aggression may be easily understood by others as a form of protest, and therefore may be relatively conventional. Other aberrant means such as self-injury may not be as easily understood as intentional communicative behavior. Short-term considerations include the subject's immediate safety and the safety of others. Long-term considerations involve the acceptability of an individual's behavior in social contexts. The primary goal when dealing with socially unacceptable expression of intent is to replace the aberrant behavior with more socially acceptable forms for expressing that intent (e.g., more acceptable ways to express protest, rejection, and frustration), rather than simply attempting to eradicate or extinguish such behavior (Donnellan, Mirenda, Mesaros, & Fassbender, 1984; Schuler & Prizant; 1987). Research has demonstrated that these problem behaviors may be reduced significantly when children and even adults learn to use more acceptable means to serve the same functions (e.g., protest or requesting assistance) (Carr & Durand, 1986; Smith, 1985).

Success in communication is also dependent on the explicitness of the signals used in expressing meanings and intents. More generalized prelinguistic means for expressing intent (such as the use of undif-

ferentiated gestures or vocalizations) do not communicate explicit content, but shift the burden of interpretation to the listener's ability to use contextual and other nonlinguistic cues in inferring intent. In the dimension of vertical programming, the rule of thumb is to target forms slightly beyond the child's current language level. As indicated, however, some intents may be expressed in far more sophisticated form than others (Wetherby, 1986). Therefore, for a particular child, an appropriate goal for one function might be the use of single- or multi-word utterances while an appropriate goal for another function might be the use of a reenactment gesture to replace disruptive behavior.

It must be kept in mind that the frequent use of memorized language forms may present a spurious picture of linguistic sophistication. Problems in understanding and assessing echolalia have been discussed elsewhere (Prizant, 1983; Schuler & Prizant, 1985). Suffice it to say, sophistication of form is not simply a matter of grammatical complexity. It is also a matter of creativity and generativity. Thus, even simple two- to three-word utterances reflecting generative productive processes should be considered more sophisticated in linguistic form than longer memorized language "chunks."

The concept of horizontal and vertical programming emphasizes the developmental interaction of communicative functions and means. New communicative functions should be taught initially through simple means within the child's repertoire. More conventional, acceptable, and sophisticated means should be mapped onto established communicative functions. Both horizontal and vertical goals may be targeted simultaneously; however, too much emphasis on vertical goals should be avoided. Autistic individuals with limited repertoires of conventional communicative behaviors may display volatile maladaptive behaviors when they cannot successfully communicate, for example, to express that they are frustrated or bored with an activity, or to indicate distress over a routine being disrupted. To circumvent this developmental progression, horizontal goals should be emphasized in young autistic children to give them a variety of appropriate alternative means to express their intentions.

In addition to vertical communication goals, vertical goals should also be targeted in deficient cognitive–social domains. For the example of the child functioning in Stage IV of symbolic play, vertical movement would be to teach conventional uses of realistic objects. Several cognitive–social goals may be targeted simultaneously. However, because the autistic child may show discrepancies across domains, it is likely that goals will be targeted at different developmental levels for different domains.

Thus, early communication intervention is not merely teaching verbal and nonverbal behavior to the child; it entails facilitating the communicative, cognitive, and social foundations of language as well as enhancing linguistic knowledge and use.

Intervention strategies

In order to address intervention goals that target communicative and symbolic behavior, special consideration must be given to the learning context and the

interaction strategies used in intervention. The design of the learning context for autistic children should be guided by the following principles.

Work at the level of the dyad, rather than the individual child

Successful communicative interactions involve the cooperative effort of two people. Therefore, changes in both members of the dyad are necessary to enhance communication development (MacDonald, 1985). For young children, the emphasis should be on adult–child interactions involving caregivers.

Structure the environment to scaffold ample opportunity for learning

For young children, the environment needs to provide a consistent and predictable schedule to encourage the child to develop a sense of anticipation and to initiate communicative behavior (see Bruner, 1978; McLean & Snyder-McLean, 1984). A variety of objects and experiences should be available to develop flexible exploratory and problem-solving strategies. Natural or contrived opportunities should be available for the child to initiate communication for a variety of reasons.

Expect the child to communicate

Wait and look expectantly at the child to signal the child's turn (MacDonald, 1985). To preclude learned helplessness, do not anticipate the child's needs; rather, encourage the child to use active signaling. Avoid verbal cues that the child may become dependent on, because the child will learn to wait for these cues and may not initiate without them.

Work on communicative acts that are either informative or collaborative

The child should be communicating, whether preverbally or verbally, either to provide information that the listener needs to know or to draw the listener's attention to something for the purpose of sharing. The physical environment can be easily modified to ensure informativeness. For example, to teach a child to say or point to a cookie to request it is not informative when the cookie is the only object of choice, but is informative when the cookie is among several choices of objects. Questions that the adult obviously already knows the answer to should be avoided. If the child's communicative behavior is not providing needed information, then it should be serving an affiliative purpose, for example, to share an interaction or a topic.

Use natural reinforcers that are consistent with the child's intent

Consider whether the child's act serves to regulate another's behavior, to engage in social interaction, or to reference joint attention, and then respond naturally to that function (Wetherby, 1986). If the child is requesting or protesting an object, the natural reinforcer is to offer or remove the object. If the child is greeting or calling, the natural reinforcer is to attend to the child. If the child is labeling or commenting, the natural reinforcer is to attend to the object or event.

Attune to the child

Adults should adjust their interaction style and level of language input to the child. For the very young child, the

emphasis should be on synchronizing interactions with the child. One effective way to do this is by imitating the child to establish a smooth flow of turn taking (see Dawson & Adams, 1984). The complexity of the adult's speech should be matched to the child's level of language comprehension (see Prizant & Schuler, 1987b). Contextual cues and gestures should be used with speech to develop verbal comprehension.

Current developmental language intervention approaches caution against adult-directed interactions. Fey (1986) described three steps in child-oriented approaches designed to follow the child's lead: (1) wait for the child to initiate some behavior; (2) interpret that behavior as communicative and meaningful; and (3) respond to that behavior in a manner that will facilitate further communicative interaction and language learning. This issue is even more critical in early intervention programs since research has shown that the vast majority of parent–child interactions involving children from birth to age 3 are child initiated (Hart, 1985). Current behavioral approaches to language treatment emphasize using incidental teaching procedures, which involve waiting for the child to initiate an interaction and then following the child's lead. Because autistic children's major problem is with communication and the use of language, a child-oriented approach may be advantageous (Prizant & Wetherby, in press). Specific antecedent strategies that encourage the child to initiate communication using minimal verbal stimuli are presented in Table 3. Consequential strat-

Table 3. Intervention strategies to entice communication

Antecedent strategies to entice child-initiated communicative acts
1. Place desired objects so that they are visible to the child but out of the child's reach or in containers that the child needs help opening.
2. Offer the child items that the child does not like or that the child does not need for an activity he or she is engaged in.
3. Engage the child in an activity that necessitates a utensil, then withhold the utensil or "sabotage" the function of the utensil.
4. Set up a turn-taking routine for three or more turns until the child anticipates the steps and then violate a step in the routine.
5. Do or say something that is unexpected or obviously absurd for the situation.
Consequential strategies to facilitate further communicative attempts
1. Interpret the child's preintentional communicative behaviors as if they were intentional.
2. Translate the child's unconventional act by coding the intent with conventional means.
3. Repeat all or a portion of the child's act to acknowledge or confirm the message.
4. Use obvious back-channel responses (i.e., verbal or nonverbal acknowledgments) to maintain the topic.
5. Provide a simplified model to encode the intent of the child's echolalic utterance.
6. Expand the child's creative utterance by making it more grammatically complete.
7. Extend the child's utterance by adding new information.
8. Ask for a clarification of the child's utterance or for further information about the topic of the child's utterance.

Note: Adapted from Constable (1983); Lucas (1980); MacDonald (1895); Prizant (1983); and Wetherby (1986).

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